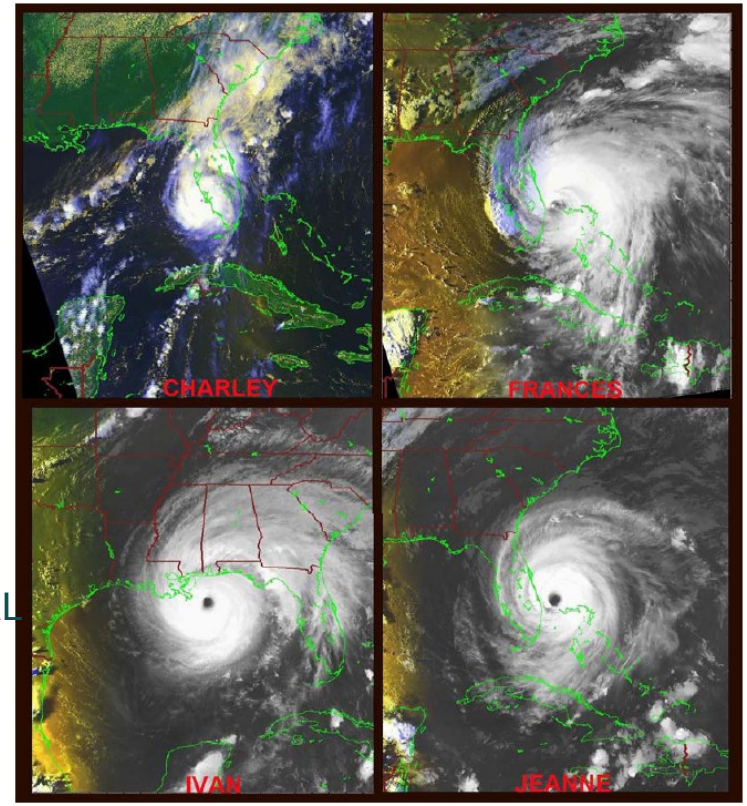
Plan Formulation Aspects of the Shore Protection Assessment

Susan Durden (NWR)
Stephen Couch (CENAN)

2004 Florida Hurricane Season

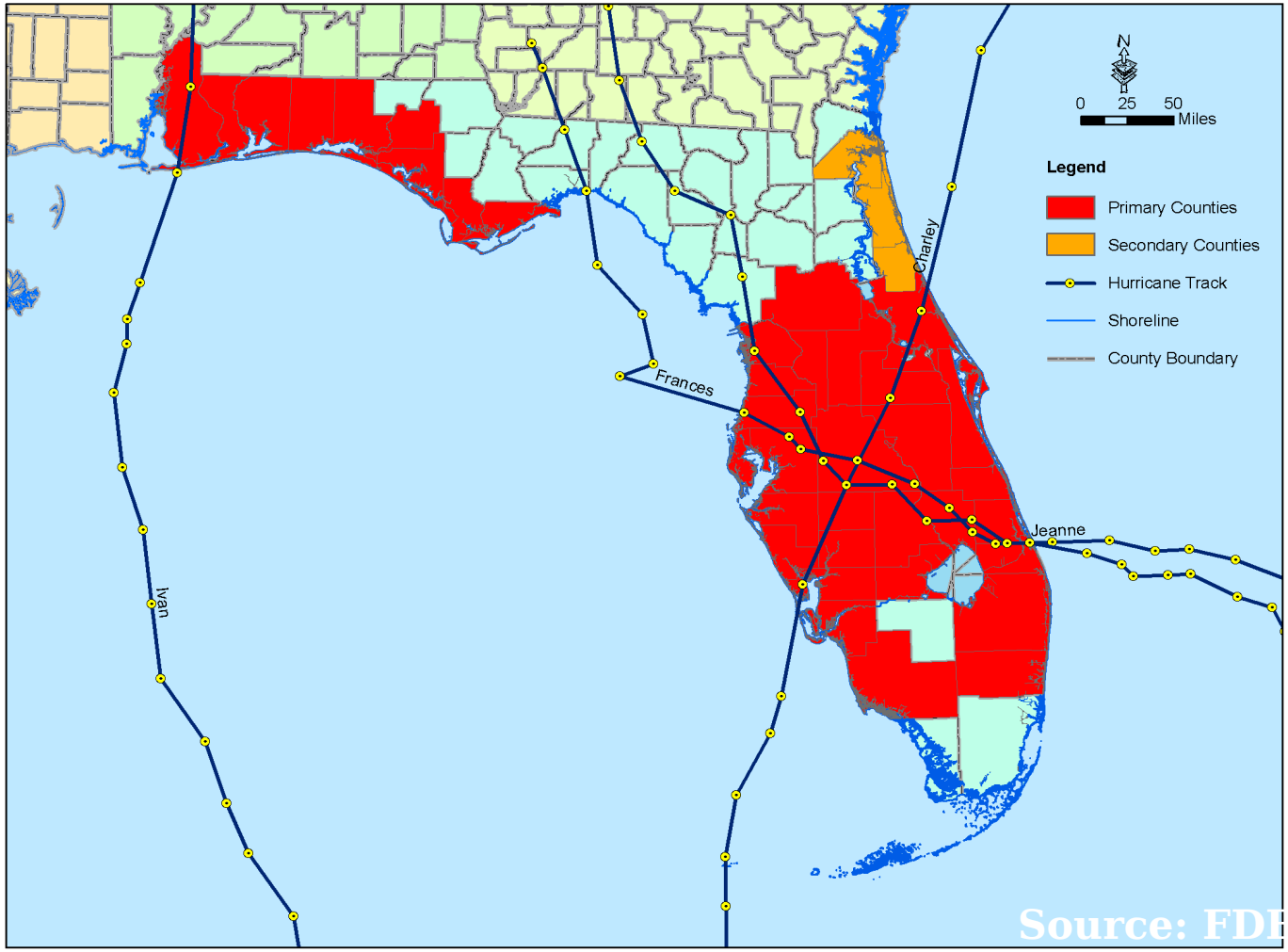
CHARLEY – Cat 4
Aug 14 – Lee County

IVAN – Cat 3
Sept 15 – Gulf Shores, AL



FRANCES – Cat 2
Sept 5 – Martin County

JEANNE – Cat 3
Sept 26 – Martin County


N
0 25 50
Miles
Legend
Primary Counties
Secondary Counties
Hurricane Track
Shoreline
County Boundary
Charley
Frances
Jeanne
Ivan
Source: FDE

SHORE PROTECTION ASSESSMENT
Army Corps Engineers
Nassau County
Ft. Clinch
N. Amelia Island
JACKSONVILLE
Duval County
Little Talbot Island
TALLAHASSEE
Florida
St. Johns County
St. Augustine Beach
Bay County
Panama City Beaches
(Mobile District)
Brevard County
Cape Canaveral, Melbourne, Indialantic
Pinellas County
Clearwater Beach Island
Sand Key
Treasure Island
Long Key
Indian River County
Sebastian Inlet State Park
Vero Beach
ORLANDO
Manatee County
Anna Maria Island
Bradenton Beach
Bridge St.
St. Lucie County
Fort Pierce Beach
TAMPA
SARASOTA
Martin County
Hutchinson Island
Sarasota County
Longboat Key
Venice Beach
Lido Key
WEST PALM BEACH
Palm Beach County
1958 Authorization
1962 Authorization
Charlotte County
Manasota Key
Broward County
Deerfield Beach, Pompano,
Lauderdale-by-the-sea
Dania, Hollywood/Hallandale
NAPLES
MIAMI
Lee County
Captiva Island,
Gasparilla Island,
Estero Island
Dade County
Sunny Isles
Virginia Key
Key Biscayne
Monroe County
Key West
Smathers Beach

Authority

Military Construction Appropriations and Emergency Supplemental
Emergency Hurricane Supplemental Appropriations Act 2005 (PL 108-324, OCT. 13, 2004)

For an additional amount for "Construction, General" for emergency expenses for repair of storm damage for authorized shore protection projects and assessment of project performance of such projects, $62,600,000, to remain available until expended.

S3P21 Funding-Level: $IIM

Program Structure

Business Area Leader:

Harry Kitch

Program Manager:

Bill Curtis

Project Managers:

- **Performance Assessment Work Unit Sharon Haggett**
- **Design and Formulation Work Unit Stephen Couch**
- **3-D Physics Based Model Development Dr. Don Resio**

Steering Committee:

- **Charley Chesnutt (IWR)**
- **Joan Pope (ERDC)**
- **Lillian Almodovar (IWR)**
- **Jan Ragus (HQ)**
- **Bruce Taylor (CERB)**
- **Kaiser Edmond (SAD)**
- **Joe Vietri (NAD)**

Program Goals

Project Performance Assessment

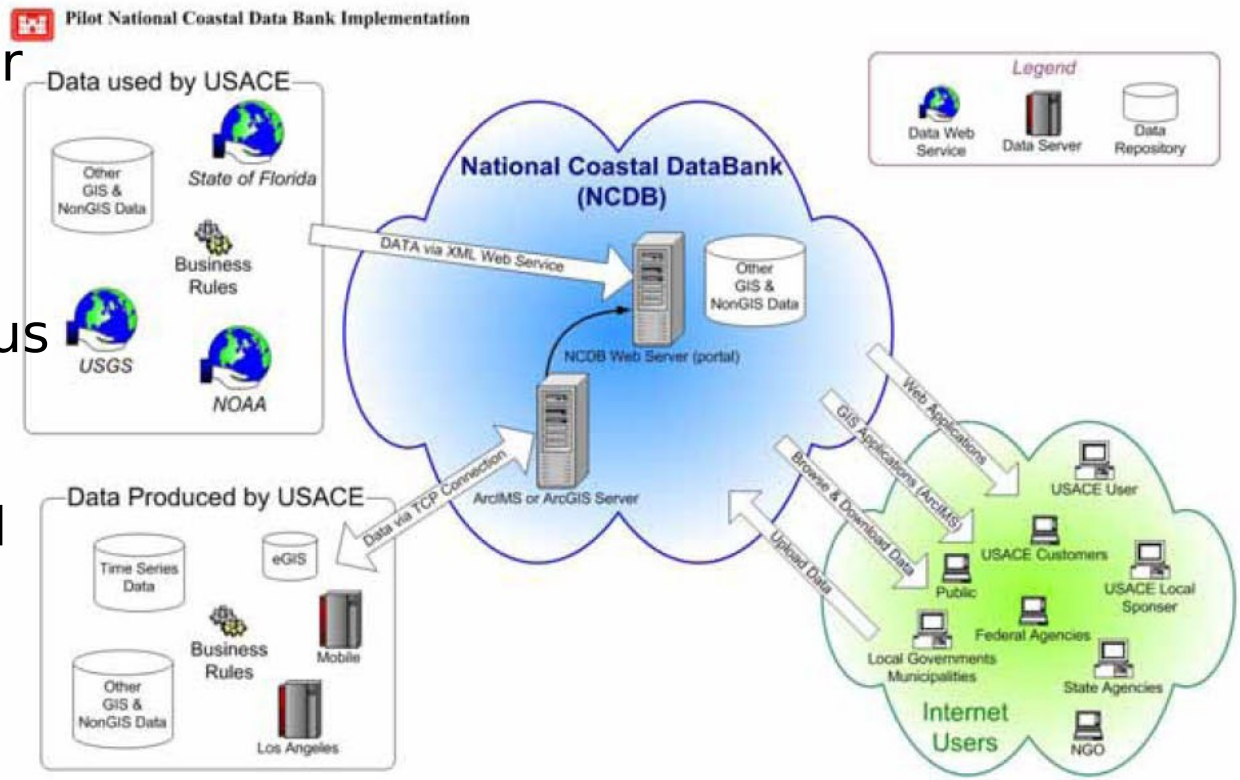
- physical response
- economic —national and regional
- environmental
- social

Communicate outcome to coastal management stakeholders

Leverage opportunities to improve future project performance

Data Management

- Develop Pilot
- Web portal and search engine for coastal data and information
- Web application service for various coastal data manipulations, calculations, and analysis tools
- Common goal of data access thru distributed net work (IOOS, eGIS, SVVWRP)



Companion Initiatives/O

PL 108-324/84-99: Restore flood control and hurricane shore protection projects to their pre-storm condition (SAD)

USACE — District, MSC, NSMS, CFDCP, RSM Demo, Cx

Other Federal:
e.g., USGS, FEMA, NOAA, DOT, NHC, ONR,

Non-Federal:
e.g., FL DEP, Local Partners, CSO, TNC...

Outreach

- Outreach and input from full range of stakeholders
- Inform and involve
- Translate science for public and decision makers
- Integrate and support work of sister Federal agencies
- Collaboration not just coordination

Outreach

External

- Clean Beaches Summit - Nov. ‘05
- CERB Presentation - Nov. ‘05
  24th, 06
- Coastal Voice Article - Feb. ‘06
- Planning Ahead Article - Feb. ‘06
- Florida Shore BPA - Feb. ‘06
  - Ongoing
- ASBPA Presentation - March 3rd, ‘06
- Congressional

Internal

- Public Affairs Offices
  - General Walsh - Feb.
- Planning CoP - Feb. & May 06
- Coastal CoP - May 06
  - Technical Coordination
    - Intra S3P2I
    - Extra S3P2I

Performance Assessment

Performance Assessment

Project Performance:

- Evaluation of full range of shore protection benefits
- Utilize information from the PIR effort undertaken by SAD
- Empirical data and formulation criteria will be assessed in order to confirm the validity of benefits
- Identify enhanced environmental opportunities as part of shore protection projects.

Watershed Assessment

- Watershed Description
- Federal and non-Federal Projects
- Historical Information
- Water Management Strategies
- Historical Weather Events and
- Past Project Performance
- 2004 Storm Characteristics
- Hydrologic Information
- Water Quality Data
- Sediment Management Issues
- FIND Activities
- Bank Stability Issues
- Muck Removal
- Impacts to Navigation
- State of Florida Proposals
- Project-related Economic Considerations
- Watershed-wide Economic Considerations
- Hard bottom Impacts
- Breaches of Barrier Islands
- Habitat Impacts
- Fish Kills
- Aquatic Vegetation
- Best Management Practices
- Cultural Resources

Design and Formulation Improvements

Objectives:

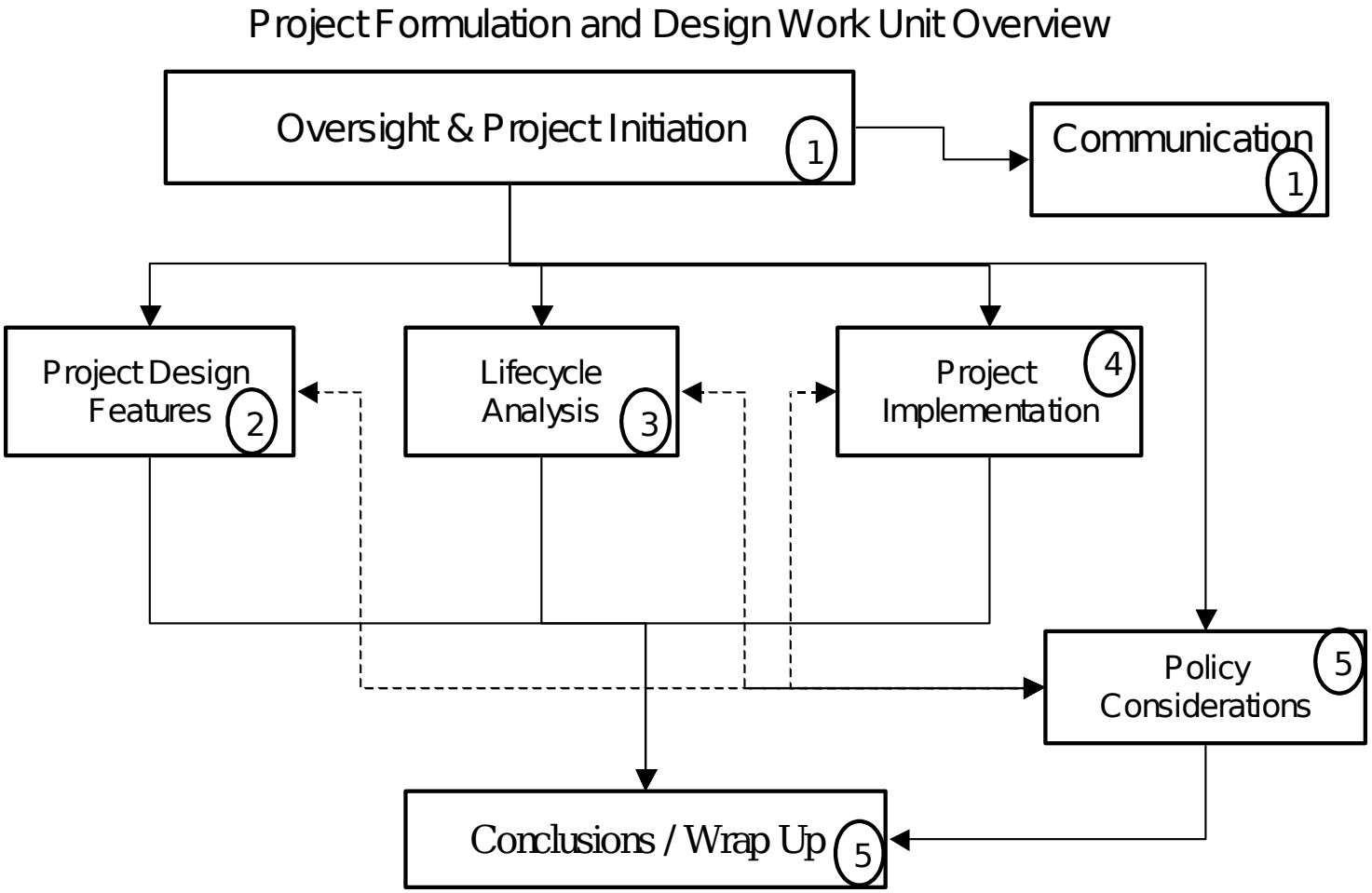
Presently – Wide Variability in Local Application of Design and Formulation Procedures

Attributable to:

- Regional Variability
- Lack of Corporate Tools that can be Consistently Applied
- Local Approaches Developed in Absence of National Tools
- Unclear / Inconsistent / Outdated Guidance

Review design and formulation procedures, relative to projects impacted by the tropical events of 2004 (and others as necessary), to identify and recommend beach nourishment formulation and design improvements that

Components:


Project Formulation and Design Work Unit Overview
Oversight & Project Initiation
1
Communication
1
Project Design Features
2
Lifecycle Analysis
3
Project Implementation
4
Policy Considerations
5
Conclusions / Wrap Up
5

Design and Formulation Improvement

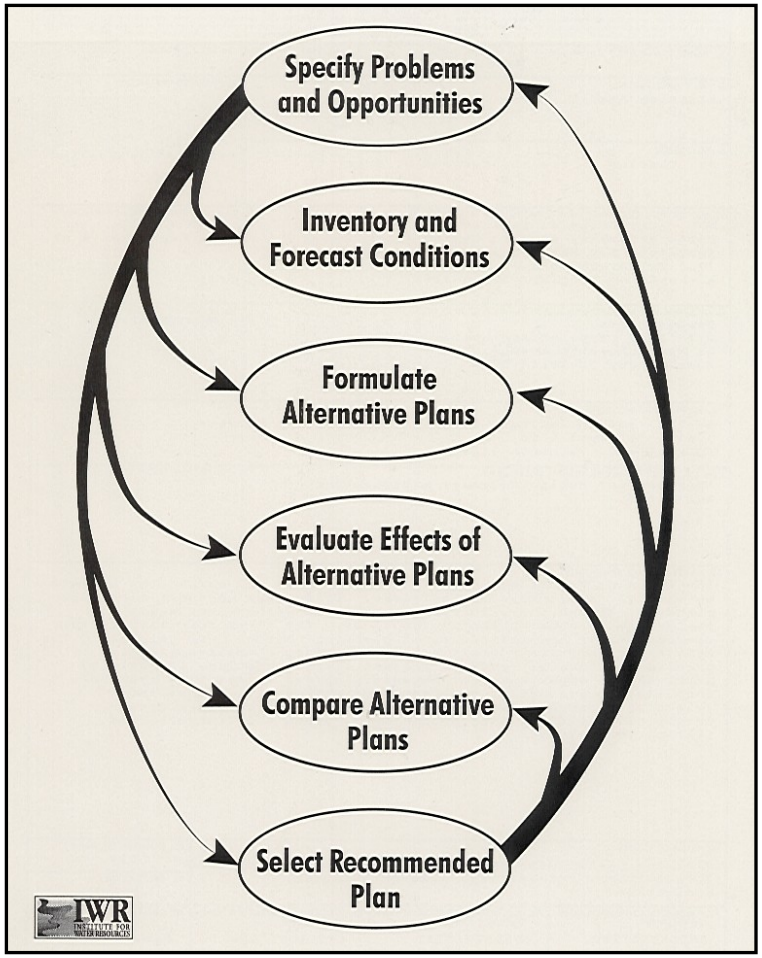
How do we Improve?

- Documentation of Current Formulation and Design Procedures
- Risk-based Beach Fill Design Guidelines
- Risk-Based Evaluation Guidelines (Beach-Fx Lifecycle Model, Operational Guidelines)
- Project Implementation, Monitoring and Maintenance Guidelines
- Recommendations for Incorporation of Changes in Corps Guidance and Regulations

Formulation Overview Effort

- **Compilation of Policy and Design Guidance**
- **Summary of Design and Formulation Procedures for Impacted Projects**
- **Survey of Input on Nationwide Practices**

Characterization of Applied Formulation and Design Procedures



Martin County GDM – completed 1994

Evaluated – relative to the planning process

To develop a template to characterize the process

Identify effect that process had on performance

Is representative of Reports from SAJ of this time period.

Highlights of Findings:

Long-period data set available for study

Utilized SBEACH to characterize storm response for return-period representative storms

Focuses on characterizing erosion damages

Identified a larger plan as optimal, but

Design Improvements

Wind / Wave / Water Level Database Improvements

- Inventory of Hindcast Efforts
- Identification of Appropriate Storm Data Input
- GIS of Modified DRP Database and other identified hindcasts
- Framework of Storm Database Development Procedures

Design of Dune and Berm Sections

- Summary of existing design methods and field experiences with dune and berm features
- Development of Parametric Relationships of Dune and berm Feature Dimensions vs. Functional and Economic Performance

Sea Level Rise Considerations in Design

Risk-based Tools and Techniques

- Summary of Existing Life-Cycle Analysis and Risk-Based Design Procedures
- Risk-based Design Guidelines

Life Cycle Analysis

Beach–Fx Application

- Joint Effort Storm Suite Data Development
- Case study – Life cycle Analysis

Beach-Fx Operational Guidelines

Project Implementation

Construction Practices
- Summary of design and construction templates methods and field experiences

Beach-Dimension Monitoring
- Update beachfill monitoring program guidelines for efficiency and effectiveness

Construction Templates/ Design Slopes
- Guidelines for applying design and construction templates

Borrow Area Characterization
- Exploration of equilibrium beach profile compatibility methods against field experiences
- The latest technologies to improve borrow area material characterizations to better anticipate grain size and fill longevity
-

Renourishment Triggers Report
- Evaluation and Recommendations for Renourishment Triggers

Emergency Fill Procedures Report
- Summary of SAD Emergency Fill Projects
- Emergency Fill Guidelines / Procedures

Benefits

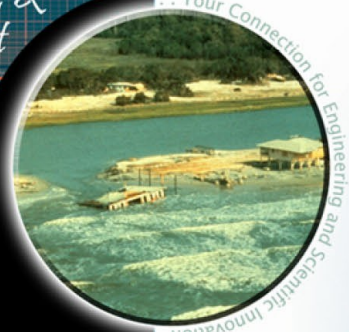
- Working effectively and collaboratively with elements of the Corps' R&D community, Field, Centers of Expertise, other Federal and non-Federal organizations, and NGOs
- Implementation of Learning Organization principles
- Full application of EOP
- Moving into the Future--CW Strategic Plan goals

SHORE PROTECTION ASSESSMENT

US Army Corps of Engineers

Many Challenges One Goal . . . .

Solving complex interactions among water, sediment, & the environment



. . Your Connection for Engineering and Scientific Innovation

US Army Corps of Engineers

Contributing to Sustainable Beach Management

Innovative Erosion Control

State-of-the-art, nontraditional approaches

Demonstration sites along Atlantic coast, Pacific coast, Great Lakes, and Gulf of Mexico

Partnership with industry
Life-cycle cost savings

Science Based

Project Performance Improvement

Emergency repairs and assessments
Collaborative communications

Protecting People and Property

Collaborative Communications

Regional Sediment Management

Sediment as a resource

System-based sediment management strategies for navigation storm damage reduction, ecosystem management

Demonstration projects across the nation

Environmentally Productive

National Shoreline Management Study

Status of the nation's shores

Information for future shore management for economic and environmental implications

Coastal management for shore protection

Federal, State and local involvement

National Interest

Science Based • Collaborative Communications • Environmentally Productive • National Interest